ACE124201B

P-Channel Enhancement Mode Power MOSFET

Description

- load switch
- battery protection

Features

- V_{DS} (V) =-20V,
- I_D = -50A
- $R_{DS(ON)}$ @V_{GS} = -4.5V, TYP 4.3mΩ
- $R_{DS(ON)}$ @V_{GS} = -2.5V, TYP 5.5mΩ

Absolute Maximum Ratings @T_A=25℃ unless otherwise noted

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	-20	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current (Continuous)*C	T_C=25℃	I_D	-50	A
	T_C=100℃		-48	
Drain Current (Pulsed)*B		I_{DM}	-200	A
Power Dissipation	T_C=25℃	P_D	52	W
Operating temperature / storage temperature		T_J/T_{STG}	-55~150	°C

Thermal Resistance Ratings

Parameter		Symbol	Maximum	Unit
Maximum Junction-to-Ambient*A	t ≤ 10s	R_{thJA}	33	°C/W
Maximum Junction- to-Case (Drain)	Steady State	R_{thJC}	2.4	

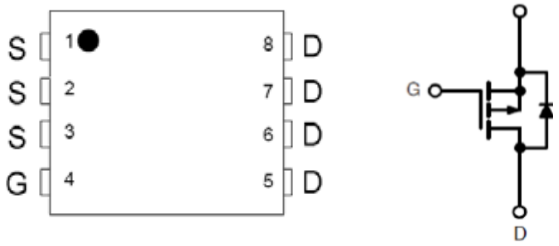
A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating. Package Limited 50A.

Packaging Type

PDFN3*3-8L



Ordering information

ACE124201B XX + H

- Halogen - free
- Pb - free
- PD: PDFN3*3-8L

Electrical Characteristics T_A=25°C, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static*B						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=-250μA	-20			V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V			-1	μA
Gate threshold voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_{DS}=-250μA	-0.4		-1	V
Gate leakage current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V			±100	nA
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-15A		4.3	5.6	mΩ
		V_{GS}=-2.5V, I_D=-10A		5.5	7.5	
Diode forward voltage	V_{SD}	I_{SD}=-10A, V_{GS}=0V			-1.2	V
Diode Forward Current *A	I_S	T_C = 25°C			-43	A
Switching						
Total gate charge	Qg	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-10A		52		nC
Gate-source charge	Qgs			8		
Gate-drain charge	Qgd			16		
Turn-on delay time	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-10V, R_L=1Ω, R_{GEN} = 3Ω		38		ns
Turn-on rise time	Tr			21		
Turn-off delay time	$t_{d(off)}$			92		
Turn-off fall time	Tf			45		
Dynamic						
Input capacitance	Ciss	V_{GS}=0V, V_{DS}=-10V, f=1MHz		3850		pF
Output capacitance	Coss			520		
Reverse transfer capacitance	Crss			330		

A: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating. Package Limited 50A.

B: Pulse Test：Pulse Wide≤ 300μs，Duty Cycle≤ 2%.

Typical Performance Characteristics T_J = 25 ℃, unless otherwise noted

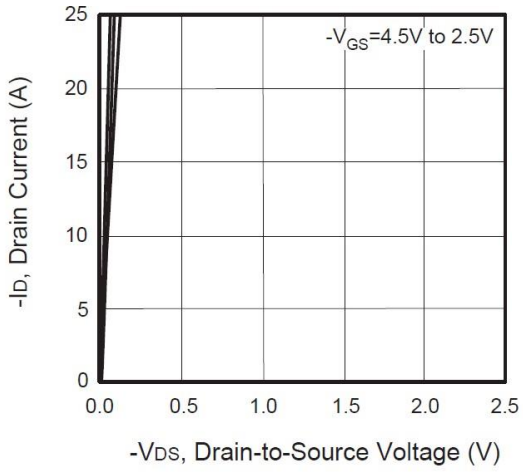


Figure 1. Output Characteristics

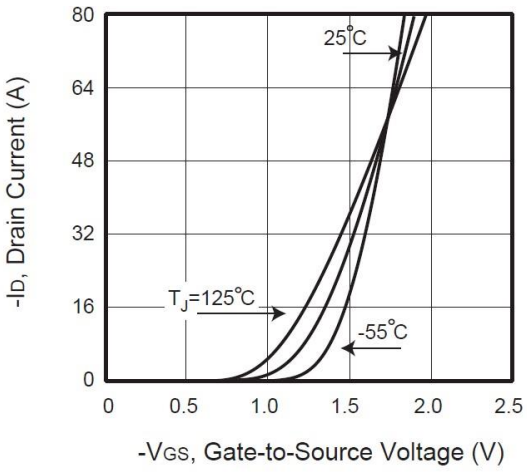


Figure 2. Transfer Characteristics

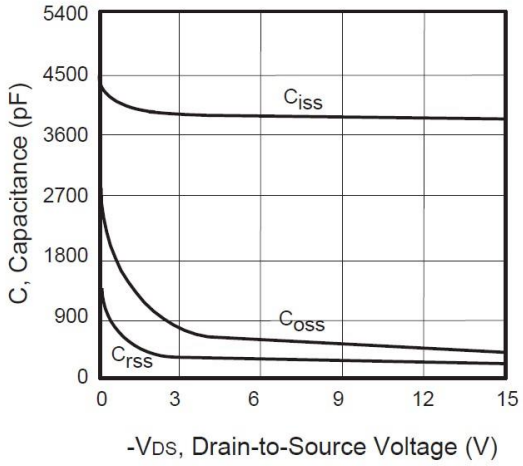


Figure 3. Capacitance

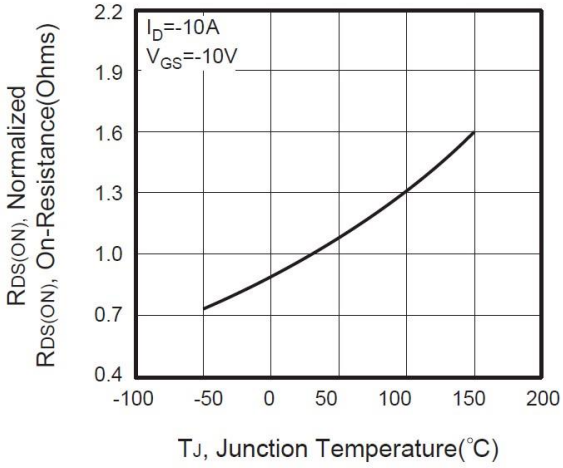


Figure 4. On-Resistance Variation with Temperature

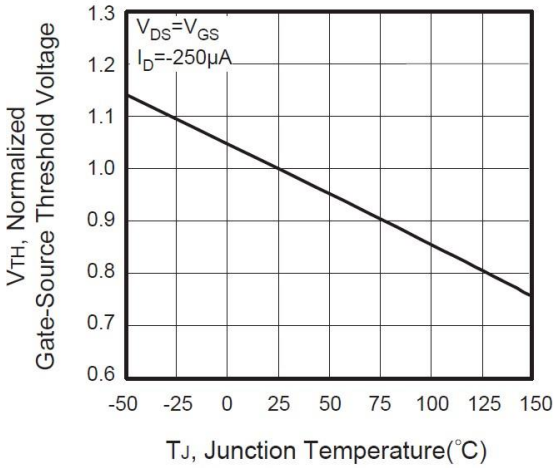


Figure 5. Gate Threshold Variation with Temperature

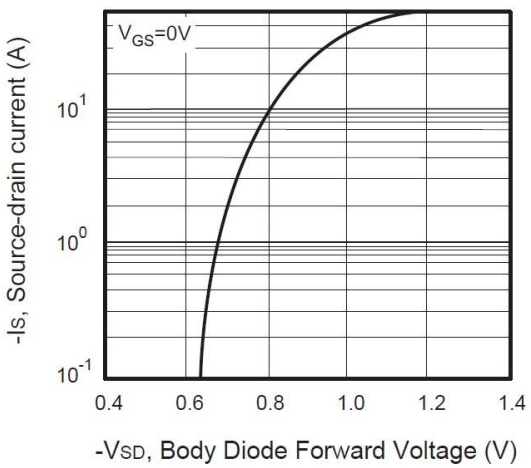


Figure 6. Body Diode Forward Voltage Variation with Source Current

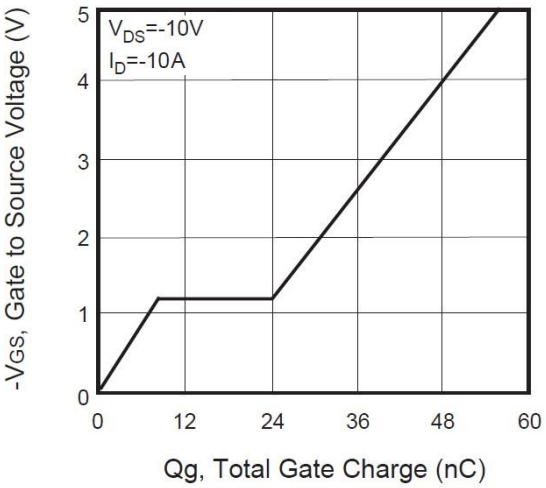


Figure 7. Gate Charge

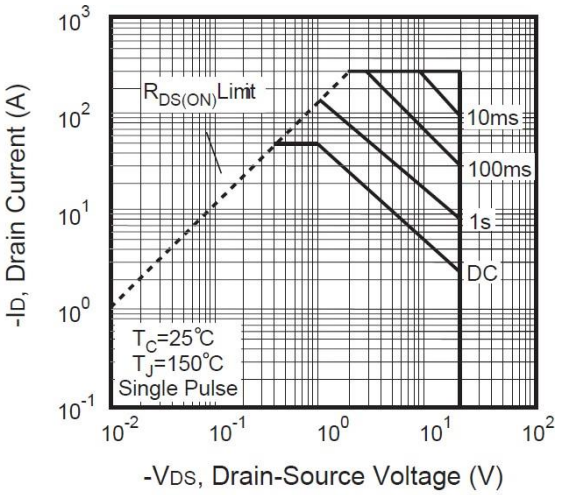


Figure 8. Maximum Safe Operating Area

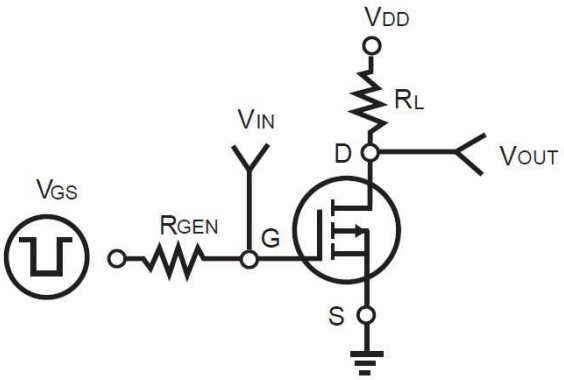


Figure 9. Switching Test Circuit

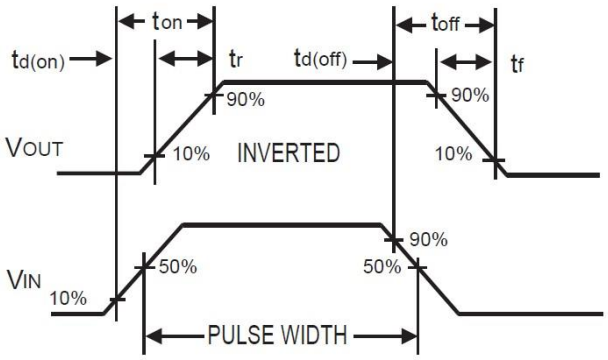


Figure 10. Switching Waveforms

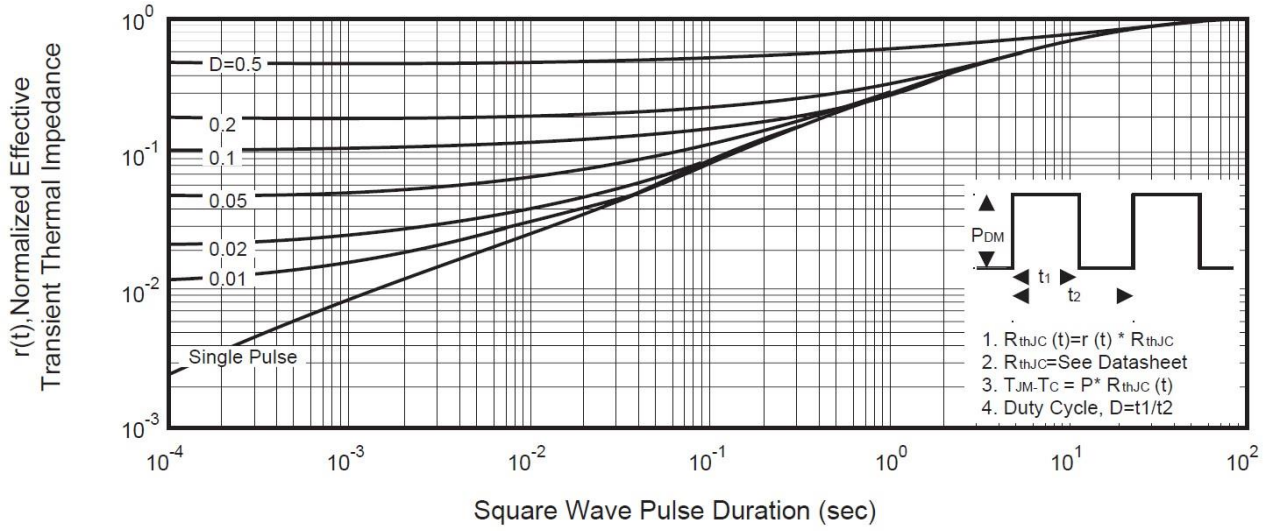
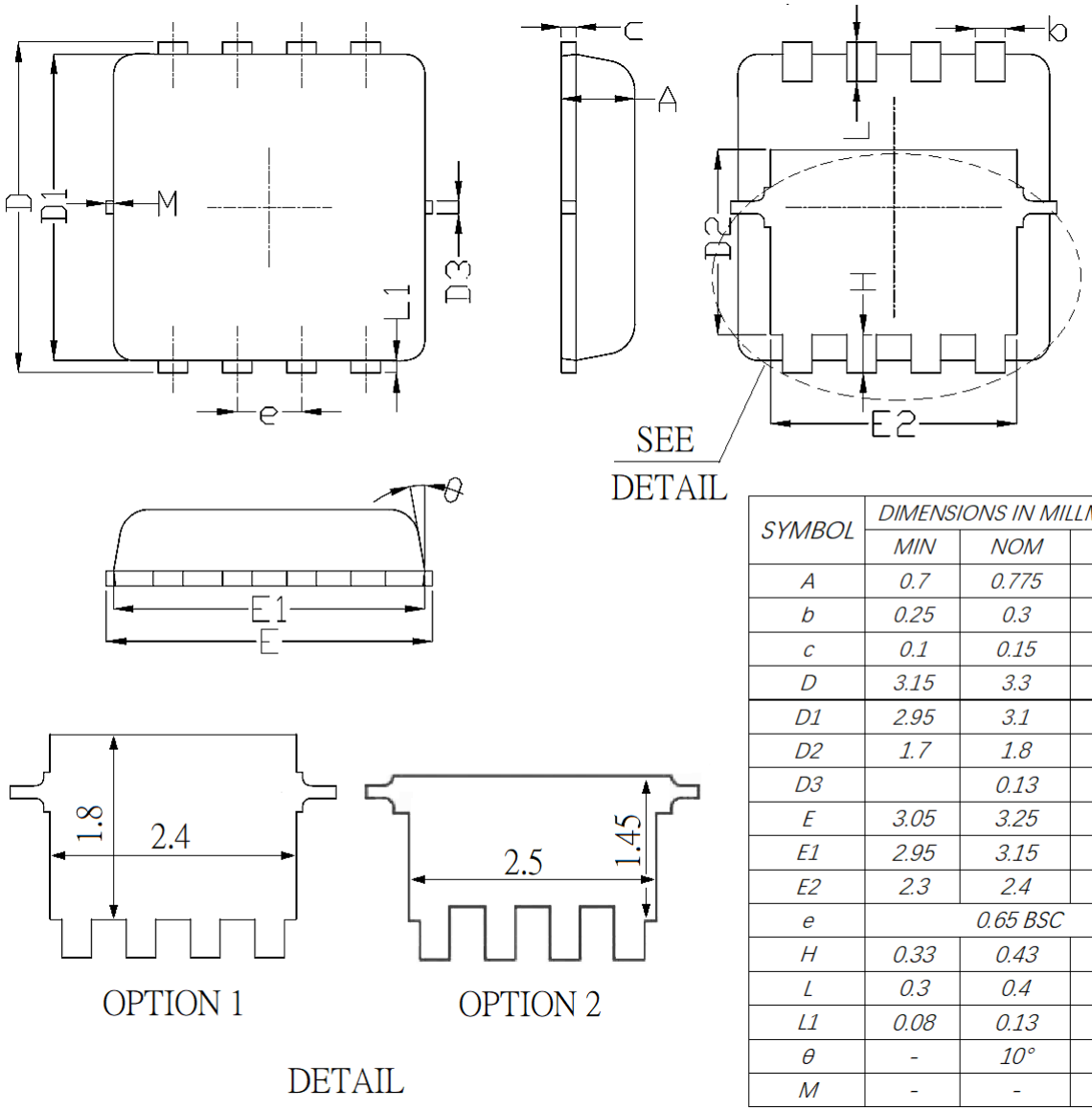


Figure 11. Normalized Thermal Transient Impedance Curve

Packing Information

PDFN3*3-8L



SYMBOL	DIMENSIONS IN MILLMETERS		
	MIN	NOM	MAX
A	0.7	0.775	0.85
b	0.25	0.3	0.35
c	0.1	0.15	0.25
D	3.15	3.3	3.4
D1	2.95	3.1	3.2
D2	1.7	1.8	1.93
D3		0.13	
E	3.05	3.25	3.35
E1	2.95	3.15	3.2
E2	2.3	2.4	2.55
e	0.65 BSC		
H	0.33	0.43	0.53
L	0.3	0.4	0.5
L1	0.08	0.13	0.18
θ	-	10°	12°
M	-	-	0.15

Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Technology Co., LTD. As sued herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and shoes failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.